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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/879,905	06/14/2001	Yasuhiro Shimada	35.C15451	5559
5514	7590	06/28/2004	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			YAM, STEPHEN K	
			ART UNIT	PAPER NUMBER
			2878	

DATE MAILED: 06/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/879,905

Applicant(s)

SHIMADA ET AL.

Examiner

Stephen Yam

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Am

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,7,9,17-19 and 23-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7,9,17-19 and 23-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 8, 2004 has been entered. Claims 1-5, 7, 9, 17-19, and 23-25 are still pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5, 17-19, and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muramatsu et al. US Patent No. 5,969,821 in view of Brezoczsky et al. US Patent No. 5,351,229.

Regarding Claims 1, 5, and 23-25, Muramatsu et al. teach (see Fig. 1, 2(e), 2(f)) a probe for detecting near-field light or irradiating near-field light (see Col. 1, lines 7-15 and 53-57), comprising a cantilever (70) having first (right) and second (left) (see Fig. 2(f)) ends, and being supported at the first end by a substrate (see Fig. 1) and having the second end free (see Col. 3, lines 37-40), a tip (2a) formed at the free end of said cantilever, said tip having an end (bottom),

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a microaperture (end part of (8b) where light is emitted (see Col. 1, lines 54-56) for utilizing near field light formed at the end of said tip (see Col. 1, lines 7-23 and Col. 6, lines 38-41), said cantilever comprising a waveguide (8) providing a space continuous with said tip (see Fig. 2(f)), and a mirror (30) (see Col. 3, lines 59-61 and Col. 9, lines 31-36) disposed in said space, wherein the mirror reflects the light entering from the microaperture toward the hollow waveguide or reflects the light transmitted in the hollow waveguide toward said microaperture (see Fig. 2(f)).

Regarding Claim 5, Muramatsu et al. teach the tip shaped as a square cone (see Fig. 3a-3e).

Regarding Claim 23, Muramatsu et al. teach (see Fig. 2(f)) the mirror having a slanted face.

Regarding Claim 24, Muramatsu et al. teach a light toward the microaperture reflected by the mirror generating near field light in the vicinity of the microaperture (see Col. 2, lines 39-42 and Col. 6, lines 38-41). Regarding Claim 25, Muramatsu et al. teach a light toward the hollow waveguide reflected by the mirror as a propagating light passing through the microaperture (see Col. 2, lines 40-42). Muramatsu et al. do not teach the tip and waveguide as hollow, with a groove formed inside the cantilever and the hollow waveguide provided in the groove.

Brezoczsky et al. teach (see Fig. 5) a similar probe, with a groove (76) within a cantilever (49) (see Fig. 4), with a hollow waveguide (76) and hollow tip (75) formed at the free end of the cantilever, and a mirror (61) disposed in a space provided with the hollow waveguide continuous with the tip. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a hollow tip and waveguide with a groove formed inside the cantilever and the hollow waveguide provided in the groove as taught by Brezoczsky et al. in the probe of Muramatsu et al., to increase light transmission speed by utilizing an air/vacuum medium to obtain faster readings.

Regarding Claims 2-4 and 17-19, Muramatsu et al. in view of Brezoczsky et al. teach the probe in Claim 1, according to the appropriate paragraph above. Regarding Claims 17-19, the body of the claims does not specify any limitations further defining a "surface observation apparatus", an "exposure apparatus", or an "information processing apparatus", so therefore the definition in the preamble cannot be given any patentable weight. Muramatsu et al. do not teach the waveguide containing a V-shaped transversal cross section, or a trapezoidal cross section, or a U-shaped transversal cross section. It is well known in the art to use different-shaped waveguide cross sections to direct light as desired. It would have been obvious to one of ordinary skill in the art at the time the invention was made to construct the waveguide with a V-shaped, trapezoidal, or U-shaped transversal cross section in the probe of Muramatsu et al. in view of Brezoczsky et al., to efficiently guide light while conforming to desired dimensional and space specifications.

4. Claims 7 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muramatsu et al. in view of Brezoczsky et al., further in view of Quate US Patent No. 5,354,985.

Regarding Claims 7 and 17-19 (as dependent from Claim 7), Muramatsu et al. in view of Brezoczsky et al. teach the probe in Claim 1, according to the appropriate paragraph above. Regarding Claims 17-19 as depending from Claim 7, the body of the claims does not specify any limitations further defining a "surface observation apparatus", an "exposure apparatus", or an "information processing apparatus", so therefore the definition in the preamble cannot be given any patentable weight. Muramatsu et al. do not teach the cantilever principally composed of silicon. Quate teaches a similar probe, wherein the cantilever (see Fig. 1B) principally composed

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of silicon (see Col. 3, line 12). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use silicon for the cantilever as taught by Quate in the probe of Muramatsu et al. in view of Brezoczsky et al., to utilize common materials to conserve manufacturing costs and to shape the optical beam for greater beam confinement and less optical loss through the cantilever.

5. Claims 9 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muramatsu et al. in view of Brezoczsky et al., further in view of Ueyanagi et al. US Patent No. 6,274,453.

Regarding Claim 9 and 17-19 (as dependent from Claim 9), Muramatsu et al. in view of Brezoczsky et al. teach the probe in Claim 1, according to the appropriate paragraph above. Regarding Claims 17-19, the body of the claims does not specify any limitations further defining a "surface observation apparatus", an "exposure apparatus", or an "information processing apparatus", so therefore the definition in the preamble cannot be given any patentable weight. Muramatsu et al. does not teach the mirror as a concave mirror. Ueyanagi et al. teach (see Fig. 6a) a similar probe, using a concave mirror (6b) to reflect light from a hollow waveguide (space within (25)). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a concave mirror as taught by Ueyanagi et al. in the probe of Muramatsu et al. in view of Brezoczsky et al., to condense and focus the emitted light without using a separate lens.

Response to Arguments

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6. Applicant's arguments with respect to claims 1-5, 7, 9, 17-19, and 23-25 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (571)272-2449. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571)272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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THANH X. LOU
PATENT EXAMINER